REMARKS

Claims 30, 32, 34, 36, 54 and 57 are all the claims pending in the application. Applicant thanks the examiner for allowance of Claims 34 and 36.

Claim 57 is amended, without prejudice, without regard to the prior art; and thus without estoppel implications.

Claims 30, 32, 54 and 57 stand rejected.

Applicant respectfully traverses the above rejections and requests reconsideration.

REJECTIONS UNDER 35 U.S.C. §103(a)

The Examiner rejected claims 30, 32, and 54 under 35 U.S.C. §103(a) as being unpatentable over Young (3,626,319) in view of Rochester (5,179,612).

The examiner rejected claim 57 under 35 U.S.C. §103(a) as being unpatentable over Young (3,626,319) in view of Davis (5,179,612).

Applicant respectfully submits that the examiner has failed to provide "articulated reasoning with some rational underpinning to support a legal conclusion of obviousness". *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). As indicated in *M.P.E.P. 2143.03*, the examiner must articulate at least the following:

(1) A finding that the prior art included each element claimed, although not necessarily in a single prior art reference, with the only difference between the claimed invention and prior art being the lack of combination of the elements in a single prior art reference;

(2) a finding that one or ordinary skill in the art could have combined the elements as claimed by known methods and, that in combination, each element merely performs the same function as it does separately;

(3) a finding that a person of ordinary skill in the art would have recognized that the results of the combination were predictable; and

(4) whatever additional findings based on the Graham factual inquiries may be necessary, in view of the facts under consideration, to explain a conclusion of obviousness.

Also, the burden is on the Office to establish a reason why a person of ordinary skill would have been prompted to combine the teachings of the cited references in the manner claimed in the application. *KSR Intn'l Co. v. Teleflex Inc.*, 82 U.S.P.Q. 2d 1385, 1396 (2007). The Office also must show that a person of ordinary skill using the combined teachings would have had a reasonable expectation of success of achieving the claimed invention. *DyStar Texttilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006). Moreover, impermissible hindsight is to be avoided, where the claimed invention is used as a roadmap to find its prior art components. *Ruiz v. A.B. Chance Co., 357 F.3d 1270, 69 U.S.P.Q.2d 1686 (Fed. Cir. 2004).* Also, a reference that teaches away from the claimed invention may negate motivation for the combination *Ormco Corp. v. Align Technology Inc., 463 F.3d 1299 (Fed. Cir. 2006).*

Independent Claims 30 and 54

The office action states as follows:

> Young discloses a method of stabilizing a short-pulse fiber laser, comprising: isolating said fiber laser in a temperature-controlled enclosure from an external environment; and operating the fiber laser within the enclosure while utilizing the enclosure to stabilize a repetition rate of the fiber laser (entire document). Figs. 1-3 of Young and the document discloses isolating the fiber laser in a temperature-controlled enclosure from an external environment, and operating the fiber laser

while utilizing the enclosure to stabilize a repetition rate of the fiber laser".

Applicant disagrees and submits that Young does not teach *stabilizing the repetition rate of a short-pulse fiber laser*. Young discloses laser structures comprising, in each case, a thin elongated laser rod, and a flash tube means formed into an integral structure. It was found that the laser may operate at improved repetition rates (*Young, col. 1*), meaning that it was expected that 50 mJ pulses at 10 pulses per second at room temperature were possible without fluid cooling.

Applicants submit that the laser of Young does not have a repetition rate per se. To the extent that this terminology is used in Young, it refers to the rate at which the laser can be induced to produce a pulse output, which in turn wholly depends on the rate and duration at which the flash tube is operated. Therefore, this structure is not comparable to the present invention, in that the presence or absence of an isolating enclosure has no cause-and-effect relationship upon the repetition rate of the laser, contrary to what is presently claimed. Moreover, Young says nothing about stabilizing any kind of rate, or how to do so.

Also, when read in context, it appears that "rapidly pulsed" in Young refers to "*the rapidity with which they (the laser) could be pulse operated by the associated flash tube means without being damaged by the large amounts of heat generated during such laser operation*" (*Young, col 1, lines 55-61*). The *disclosure suggests that Young was concerned with potential thermal damage that could occur at increased laser operation rates. Young is not concerned at all with laser rate stabilization.*

Young further does not teach a short pulse width. Therefore, a "short pulse" or "short pulse fiber laser" is not disclosed, as recited in applicant's claims. Applicant believes, as a result

of flashlamp pumping and otherwise unspecified parameters, that Young produces pulse widths several orders of magnitude larger than applicant's short pulse lasers (e.g.: applicant's lasers produce, by way of example, picosecond or femtosecond pulses).

Applicant's claims recite stabilization of the repetition rate of a short pulse fiber laser. The repetition rate may be in the MHz range. The examples in the present specification, which include but are not restricted to CW mode-locked lasers, show repetition rates of 10 MHz, 100 MHz, and 1 GHz and corresponding cavity lengths of 15 m, 1.5m, and .15 m respectively. Fractional variations in repetition rate are caused by variations in the cavity length (including relative variations with the use of two lasers). None of these problems are addressed in Young.

The Office Action also states Rochester teaches "supporting said fiber laser by wrapping it onto an acoustically damped assembly (bobbin)" in Fig. 3. Applicant disagrees and submits that the structure taught is Rochester is a container for holding an optical fiber, for storage and not during use. Rochester teaches damping rotational motion of the optical fiber during payout, to encourage a linear payout rather than a helical payout, so as to control a radar signature. Other features relate to avoidance of fiber damage. There is no disclosure of a fiber laser, an acoustically damped assembly, or other features recited in Claims 20 and 54 related to stabilizing the repetition rate of a short pulse fiber laser.

Therefore, for at least the reasons above, applicant submits the office action fails to provide the articulated reasoning (1) - (3) set forth above, as required to support the rejection. Moreover, the Office Action does not show that a person of ordinary skill using the combined teachings would have had a reasonable expectation of success of achieving the claimed invention. Applicant respectfully submits that the Office Action uses Applicant's claimed

invention as a roadmap to find its prior art components, with impermissible hindsight. Therefore, Applicant submits 30, 32, and 54 are patentable and requests the rejection be withdrawn.

Independent Claim 57

The Office Action states that Young discloses all limitations of the claim except for "providing a piezoelectric transducer in communication with the laser, applying a voltage to the piezoelectric transducer, wherein the repetition rate of the laser is controlled by movement of the piezoelectric transducer, and providing a phase locked loop circuit for controlling the average repetition rate of the laser."

As set forth above, Young does not teach stabilizing the repetition rate of a short pulse fiber laser by controlling the temperature of the fiber. Davis does not cure this deficiency. Thus, the combination of Young and Davis does not disclose Applicant's claimed method.

Davis discloses a piezoelectric for laser-based transducers used in a fiber-based interferometer, for example a Mach-Zehnder interferometer using a radiant energy means. The source of radiant energy may be a laser. However, there is no disclosure or hint of controlling the repetition rate of a short pulse fiber laser by movement of the piezoelectric transducer in communication with the laser.

Applicant respectfully submits that claim 57 is patentable and requests the rejection be withdrawn.

Claim 57 has also been amended to explicitly recite *"isolating said fiber laser in a temperature-controlled enclosure from an external environment"* to more particularly point out this feature.

Dependent Claim 32

Without conceding the propriety of combining Young and Rochester, Applicant respectfully submits that the combination does not teach or suggest all the features of claim 32. Claim 32 depends from and include all the features of independent Claim 30, and recites unique combinations of additional features not taught or suggested by the cited combination. Thus, because claim 30 is patentable, claim 32 is also patentable.

Therefore, Applicant submits that pending claims are patentable.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

/Richard Turner/
Richard C. Turner
Registration No. 29,710

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
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